

WHAT IS CLAIMED IS:

1. A method for gamut mapping an original image using at least one of plural different gamut mapping algorithms, said method comprising the steps of:

5 analyzing spatial frequency content of the original image;
associating regions of the original image with one of the plural gamut mapping algorithms based on the analysis of spatial frequency content; and

10 gamut mapping each region associated with a gamut mapping algorithm using the associated gamut mapping algorithm so as to produce a gamut mapped image of the original image.

15 2. A method according to Claim 1, wherein said associating step includes the step of constructing one or more spatial masks which mask regions of the original image for gamut mapping by a first gamut mapping algorithm and which mask regions of the original image for gamut mapping by a second gamut mapping algorithm.

20 3. A method according to Claim 1, wherein said step of associating includes the step of segregating regions of the original image into busy regions and smooth regions.

25 4. A method according to Claim 3, wherein said associating step includes the step of constructing one or more spatial masks which mask regions of the original image for gamut mapping by a first gamut mapping algorithm and which mask regions of the original image for gamut mapping by a second gamut mapping algorithm.

30 5. A method according to Claim 3, wherein said step of gamut mapping includes gamut mapping by a first gamut mapping algorithm

for smooth regions and gamut mapping by a second gamut mapping algorithm for busy regions.

5 6. A method according to Claim 5, wherein said associating step includes the step of constructing one or more spatial masks which mask regions of the original image for gamut mapping by a first gamut mapping algorithm and which mask regions of the original image for gamut mapping by a second gamut mapping algorithm.

10 7. A method according to claim 4, wherein the first gamut mapping algorithm is a clipping algorithm and wherein said second gamut mapping algorithm is a compression algorithm.

15 8. A method according to Claim 7, wherein said associating step includes the step of constructing one or more spatial masks which mask regions of the original image for gamut mapping by a first gamut mapping algorithm and which mask regions of the original image for gamut mapping by a second gamut mapping algorithm.

20 9. A method according to Claim 1, wherein said analyzing step uses a spatial frequency analysis tool selected from the group consisting of discrete cosine transform, discrete Fourier transform, and discrete wavelet transform.

25 10. A method according to Claim 9, wherein said associating step associates regions of the original image with one of the plural gamut mapping algorithms based on coefficients derived in said spatial frequency analysis tool.

30 11. A method according to Claim 1, further comprising the step of transforming the original image into a perceptual color space.

12. A method according to Claim 11, further comprising the step of constructing one or more spatial masks based on individual ones of the channels in the perceptual color space, and wherein said associating step associates regions of the original image with one of the plural gamut mapping algorithms based on a pre-designated threshold value in the spatial masks.

13. A method according to Claim 12, wherein said analyzing step produces frequency-related coefficients, and wherein said constructing step constructs the one or more spatial masks based on normalized values of the coefficients.

14. A method according to Claim 1, further comprising the step of transforming the original image into a viewing condition independent color space.

15. A method according to Claim 11, further comprising the step of constructing one or more spatial masks based on individual ones of the channels in the viewing condition independent color space, and wherein said associating step associates regions of the original image with one of the plural gamut mapping algorithms based on a pre-designated threshold value in the spatial masks.

16. A method according to Claim 15, wherein said analyzing step produces frequency-related coefficients, and wherein said constructing step constructs the one or more spatial masks based on normalized values of the coefficients.

17. An apparatus for gamut mapping an original image using at least one of plural different gamut mapping algorithms, comprising:

a program memory for storing process steps executable to perform a method according to any of Claims 1 to 16.

5 18. Computer-executable process steps stored on a computer readable medium, said computer executable process steps for gamut mapping an original image using at least one of plural different gamut mapping algorithms, said computer-executable process steps executable to perform a method according to any of Claims 1 to 16.

10 19. A computer-readable medium which stores computer-executable process steps, the computer executable process steps for gamut mapping an original image using at least one of plural different gamut mapping algorithms, said computer-executable process steps executable to perform a method according to any of Claims 1 to 16.

15 20. A color management module comprising:
a first transformation sequence that transforms color image data to a profile connector space;
a gamut mapping module that maps colors in the color image data to colors reproducible by a color output device, so as to obtain gamut-mapped image data; and
20 a second transformation sequence that transforms the gamut-mapped image data to a device dependent color space for the color output device;
wherein said gamut mapping module gamut-maps in
25 accordance with the method of any of Claims 1 to 16.

21. A color management module according to Claim 20, wherein the color management module is comprised of a color print driver.

22. A color management module according to Claim 20, wherein the color management module is comprised of a stand-alone application program.

5 23. A color management module according to Claim 20, wherein the color management module is comprised of a dynamic link library.

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